CENTER FOR BIOMOLECULAR TECHNOLOGIES

THE CENTER

Established in 1998 to develop and commercialize technologies aimed at improving the efficiency of detecting rearrangements in the human genome and reducing the high cost of genetic microarrays, i.e., "gene chips", which are ideally suited to unraveling complex genetic information. Each of these aims promises to remove major technological impediments in the biotechnology and health fields. For example, the inefficient methods to detect chromosome rearrangements have hitherto limited their use in the early detection of cancer, environmental health, and population genetics, even though such rearrangements are known to provide important diagnostic information.

THE TECHNOLOGY

To improve the efficiency of detecting genetic rearrangements, the Center technology is focused on the development of proprietary reagents, methods, and kits that permit the bulk isolation and quantification of DNA with either specific or random rearrangements from, e.g., a small blood sample. This technology promises to replace the present methods, such as fluorescence microscopy and polymerase chain reaction (PCR) analyses, in the detection of such rearrangements.

To reduce the cost of microarrays, the Center technology is focused on developing devices and reagents that would serve to actively transport DNA, proteins, cells, or other small objects into low-cost, disposable arrays. Each array may have hundreds of thousands of uniquely addressable microlocations. The Center's novel proprietary approach provides an opportunity for substantial cost reductions in the microarray technology along with significant enhancements in user applications.

THE ACCOMPLISHMENTS

The Center's efforts during FY99 were principally focused on the development of model systems, proof-of-principle demonstrations, and on disclosures and patents to secure these proprietary technologies. Initial model systems were developed and successfully tested for both technology types. The DNA rearrangement technology has developed rapidly and it is anticipated that a spin-off company will be created in FY01 to focus on health and environmental applications, including the marketing of reagents and kits.

CONTACT

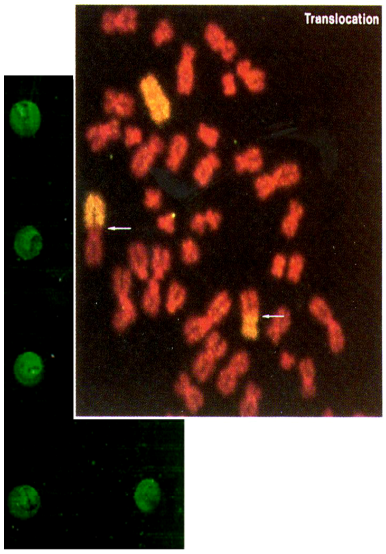
Director: Tore Straume, Ph.D.
University of Utah, Salt Lake City, Utah
Phone 801-581-6853, Fax 801-581-7008,
t.straume@m.cc.utah.edu

Can You Imagine...

. . . detecting the development of cancer years before the appearance of any symptoms, at a time when intervention may be highly effective?

THE CENTER DEVELOPS AND COMMERCIALIZES NEW TECHNOLOGIES FOCUSED ON THE EARLY DETECTION OF CANCER AND LOW COST DISPOSABLE MICROARRAYS.

The Center technology would



eliminate the need for costly cytogenetic analyses to detect chromosome rearrangements such as the translocation identified in the above microscope image (modified from Straume et al. 1992). Instead, the Center's proprietary reagents and methods are used to extract and quantify such events directly from bulk samples of cells. Also shown above is a small part of a test array consisting of proprietary reagents with properties that permit efficient positioning and detection. The array reagents, together with special array devices, are designed to actively transport DNA, proteins, cells, or other small objects into low-cost, disposable microarrays.